Amendments to the Drawings

The attached seven (7) sheets of formal drawings replace the original seven (7) sheets of informal drawings.

The attached sheets of drawings include a sheet having changes to FIG. 3A. This sheet, which includes FIG. 3A, replaces the original sheet including FIG. 3A. FIG. 3A has been amended by adding the label "NO" to the arrow from box 216 to box 240 in FIG. 3A. FIG. 3A has further been amended by adding the label "YES" to the arrow from box 216 to box 218 in FIG. 3A.

Attachment: Replacement Sheets

REMARKS/ARGUMENTS

Claims 1-40 are in the case. The applicants have studied the office action mailed August 15, 2006 and have made the changes believed appropriate to place the application in condition for allowance. Reconsideration and reexamination are respectfully requested.

Applicants wish to thank the Examiner for the courtesy of a telephone interview granted December 6, 2006. During the interview, the Examiner indicated that he had no questions concerning the proposed amendment submitted with the interview request. The undersigned indicated that the proposed amendment would be formally submitted in response to the outstanding office action. No agreement was reached on any issue. It is believed that the record of the substance of the interview is complete. Should the Examiner deem additional information should be made of record, the Examiner is respectfully requested to afford the applicants an opportunity to supplement the record.

The claims have been rejected under 35 U.S.C. §112, second paragraph, as indefinite. This rejection is respectfully traversed.

It is the Examiner's position that the applicants are using the term "progress indicator" in a manner other than its accepted meaning which is "checkpoint." However, it is respectfully submitted that the applicants have used the term "progress indicator" in a manner consistent with the term "checkpoint." See for example, paragraph [0004]:

> ... As the migration proceeds, migration progress indicators or "checkpoints" are typically written to a configuration area 14a, 14b of each RAID disk 12a, 12b. ...

and paragraph [0012]:

> In migrating data from one storage organization on one or more disk drives to another storage organization on the same or other disk drives, progress indicators or checkpoints are written on the disk drives. ...

It is therefore respectfully submitted that the rejection of the claims as indefinite should be withdrawn.

The claims have been rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. This rejection is respectfully traversed.

With respect to claim 1, it is respectfully submitted that the specification as originally filed provided a clear and concise explanation of how "the number of progress indicator data write operations is less than the number of copy data write operations" as required by claim 1,

such that a skilled artisan can make and use the claimed method. For example, paragraph 27 of the specification as originally filed provided:

> *[00027] In connection with the direct copying of the selected unit of user data, in accordance with another aspect of the migration and checkpointing described herein, the migration manager performs a series of tests on the selected unit of user data, such as, for example, the tests indicated in process blocks 242, 244, 246. If the result of one of the tests of blocks 242, 244, 246 is positive, the migration manager 130 writes (block 250) a progress checkpoint to the configuration areas 202a, 202b. However, if the result of all of the tests of blocks 242, 244, 246 are negative, the migration manager 130, in accordance with an aspect of the described migration process, can defer the writing of a progress checkpoint to the configuration areas 202a, 202b. As a consequence, a substantial portion of data may be migrated from the source non-RAID volume 212 to the destination RAID volume 214 without writing a progress checkpoint for each unit of user data migrated.*

It is respectfully submitted that if the migration manager 130 defers the writing of a progress checkpoint such that the migration manager 130 does not write a progress checkpoint for each unit of user data migrated as explained in paragraph 27, it is clear that "the number of progress indicator data write operations is less than the number of copy data write operations" as required by claim 1. Furthermore, paragraph 27 above has been amended as set forth below to include specific claim language of original claim 1:

> *[00027] In connection with the direct copying of the selected unit of user data, in accordance with another aspect of the migration and checkpointing described herein, the migration manager performs a series of tests on the selected unit of user data, such as, for example, the tests indicated in process blocks 242, 244, 246. If the result of one of the tests of blocks 242, 244, 246 is positive, the migration manager 130 writes (block 250) a progress checkpoint to the configuration areas 202a, 202b. However, if the result of all of the tests of blocks 242, 244, 246 are negative, the migration manager 130, in accordance with an aspect of the described migration process, can defer the writing of a progress checkpoint to the configuration areas 202a, 202b. As a consequence, a substantial portion of data may be migrated from the source non-RAID volume 212 to the destination RAID volume 214 without*

writing a progress checkpoint for each unit of user data migrated. <u>Thus, the number of progress</u>
<u>*indicator data write operations is less than the number of copy data write operations.*</u>

It is further respectfully submitted that the specification as originally filed provides a
clear and concise explanation of why "the number of progress indicator data write operations is
less than the number of copy data write operations" as required by claim 1. For example,
paragraph 14 of the specification as originally filed teaches that the data migration and
checkpointing process of the illustrated embodiment "can significantly reduce disk write
operations resulting from the checkpointing operation and hence can increase the overall speed
of the migration process." It is of course recognized that other advantages either in addition to or
instead of those noted, may be realized, depending upon the particular application.

With respect to claims 10 and 22, it is respectfully submitted that the specification as
originally filed provided a clear and concise explanation of the manner and processing of making
and using the claimed "lacks an indication" as required by claims 10 or 22, for example, such
that a skilled artisan can make and use the claimed method or article. For example, paragraph 28
of the specification as originally filed provides an example of a progress indicator written to the
area of the destination volume, wherein the progress indicator has an indication that a particular
unit of data has been successfully copied to the destination volume:

> *[00028] For example, FIG. 4B shows a first portion of user data 252 from the source*
> *non-RAID volume 212 which has been successfully migrated to the destination RAID volume 214*
> *as RAID portions 252a and 252b.   The user data portion 252 includes a plurality of units of user*
> *data. The user data portion 252 has been both copied and checkpointed. Hence, the last*
> *progress checkpoint written to the configuration areas 202a, 202b indicates the address of the*
> *last unit of user data contained within the successfully migrated portion 252.*

Conversely, paragraph 29 of the specification as originally filed provides an example of a
progress indicator written to the area of the destination volume, wherein the progress indicator
lacks an indication that a particular unit of data has been successfully copied to the destination
volume:

> *[00029]   FIG. 4B also shows another portion 254 of user data following the portion*
> *252 of user data. The user data portion 254 includes a plurality of units of user data which were*

successfully copied to the destination RAID volume as RAID portions 254a and 254b but none of
the units of portion 254 has been checkpointed at this point in the migration process. Instead, the
writing of checkpoints during the copying of the units of user data of the portion 254 has been
bypassed to reduce the number of data write operations to the configuration areas 202a, 202b
during this portion of the migration process. Hence, as each unit of user data of the portion 254
was selected (block 210) and copied (block 240), each of the tests of the process blocks 242, 244,
246 was determined to have been passed such that a progress checkpoint write operation (block
250) could be bypassed.

It is respectfully submitted that if the migration manager 130 bypasses the writing of a
progress checkpoint such that the migration manager 130 does not write a progress checkpoint
for each unit of user data migrated as explained in paragraph 29, it is clear that "the last progress
indicator written to the area of the destination volume lacks an indication that the particular unit
of data has been successfully copied to the destination volume" as required by claim 10.
Furthermore, paragraph 29 above has been amended as set forth below to include specific claim
language of original claim 10:

> [00029] *FIG. 4B also shows another portion 254 of user data following the portion*
> *252 of user data. The user data portion 254 includes a plurality of units of user data which were*
> *successfully copied to the destination RAID volume as RAID portions 254a and 254b but none of*
> *the units of portion 254 has been checkpointed at this point in the migration process. Instead, the*
> *writing of checkpoints during the copying of the units of user data of the portion 254 has been*
> *bypassed to reduce the number of data write operations to the configuration areas 202a, 202b*
> *during this portion of the migration process. Hence, as each unit of user data of the portion 254*
> *was selected (block 210) and copied (block 240), each of the tests of the process blocks 242, 244,*
> *246 was determined to have been passed such that a progress checkpoint write operation (block*
> *250) could be bypassed. As a result, the last progress indicator written to the area of the*
> *destination volume lacks an indication that a particular unit of data has been successfully copied*
> *to the destination volume.*

Claims 11 and 23 have been amended to recite "wherein said units of data are copied to
the destination volume in address sequential order and the defined set of conditions includes the
condition of a unit of data in the sequence to be copied having a destination location within the

destination volume, which overlaps with a portion of the destination volume containing units of data copied and the last progress indicator lacks an indication that the units of data of the destination volume portion have been successfully copied to the destination volume." It is respectfully submitted that the specification as originally filed provided a clear and concise explanation of the manner and processing of making and using the claimed "overlaps with a portion of the destination volume containing units of data copied" as required by claims 11 or 23, for example, such that a skilled artisan can make and use the claimed method or article. For example, paragraphs 39 and 41 of the specification as originally filed provide an example of a determination of whether the destination of the next unit of user data to be copied is in a portion of data previously copied but not checkpointed:

> *[00039]   FIG. 4D also shows a unit 266 of user data which has been selected (block 210) for migration to the destination RAID volume to data blocks 266a and 266b of the destination RAID volume. However, the destination block 268a of the next unit 268 of user data to be selected and copied, is below a line 272 separating the data portion 262 (copied and checkpointed) from the data portion 264 (copied but not checkpointed). Hence, the destination 268a of the next unit 268 of user data to be selected and copied is in the data portion 264, that is, a portion of data previously copied but not checkpointed. Thus, if the user data of unit 268 is written to destination 268a of disk driver 150a, a portion of the data portion 264 of disk drive 150a will be overwritten since it is the same disk drive 150a.*
>
> *...*
>
> *[00041]   Accordingly, in the illustrated embodiment, a determination is made (block 244) as to whether the destination of the next unit of user data to be copied is in a portion of data previously copied but not checkpointed. ...*

It has been established above that if the migration manager 130 bypasses the writing of a progress checkpoint such that the migration manager 130 does not write a progress checkpoint for each unit of user data migrated as explained in paragraph 29, it is clear that "the last progress indicator written to the area of the destination volume lacks an indication that the particular unit of data has been successfully copied to the destination volume" as required by claim 11 or 23.

It is therefore respectfully submitted that the rejection of the claims as nonenabled should be withdrawn.

Claims 1-6, 10-18 and 22-24 have been rejected as anticipated by US Pat. No. 6,467,023 to DeKoning. This rejection is respectfully traversed.

For example, claim 1 is directed to a method, comprising, inter alia, "… writing an additional progress indicator in an additional progress indicator data write operation to said area of said destination volume indicating the successful copying of at least said plurality of units of data wherein the number of progress indicator data write operations is less than the number of copy data write operations." The Examiner's citations to the DeKoning reference appear to be directed to a method depicted in FIG. 3 in which for each initialization operation 302, there is a corresponding checkpoint generation operation 307. In contrast, in the illustrated embodiment of the present application, there can be numerous data copying operations 240 (FIG. 3A) for which there are no corresponding checkpoint writing operations 250 if the tests 242, 244, 246 are satisfied (each defined condition is absent). The Examiner has failed to cite any teaching or suggestion in the DeKoning reference of "… writing an additional progress indicator in an additional progress indicator data write operation to said area of said destination volume indicating the successful copying of at least said plurality of units of data wherein the number of progress indicator data write operations is less than the number of copy data write operations" as required by claim 1.

Claims have also been rejected as obvious over the DeKoning reference in view of selected other references such as US Pat. No. 6,058,489 to Schultz, US Pub. No. 2004/0260873 to Watanabe, or US Pat. No. 5, 701,463 to Malcomb. However, the deficiencies of the DeKoning reference are not met by the Examiner's citations to the Schultz, Watanable or Malcomb references, considered alone or in combination.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1-40 are patentable over the art of record. Applicants have not added any claims. Nonetheless, should any additional fees be required, please charge Deposit Account No. 50-0585.

The attorney of record invites the Examiner to contact him at (310) 553-7970 if the Examiner believes such contact would advance the prosecution of the case.

Dated: December 6, 2006   By: /William Konrad/

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